District of Port Edward

Water Quality Report

Annual Report 2019

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Figure1: Port Edward Water Treatment Plant Main Building

1. INTRODUCTION

As required by the British Columbia Drinking Water Protection Act, the District of Port Edward provides an Annual Report. The information has been compiled to help you better understand your drinking water and how your municipal water system operates. This report outlines the water source, distribution, and testing methods as well as other information that may be of interest to the public.

2. BACKGROUND

The District of Port Edward operates and maintains a public water distribution system, guided by the *Drinking Water Protection Act* and its underlying regulations as well as adherence to the *Guidelines for Canadian Drinking Water Quality*.

3. SYSTEM OVERVIEW

The District of Port Edward has a population of approximately 500 with 245 water connections. Alwyn Lake is the source of the District of Port Edward's municipal water supply.

The Water Treatment Plant was built in 2004 along the bank of Wolf Creek to supply a population of up to 1000 with opportunity to expand affordably to supply up to 1500. The plant is primarily designed to remove colour and turbidity with a mixed media /Disolved Air Flotation (DAF) system with water supplied from Alwyn Lake under a water license of a maximum 31,000 m3 per day.

The plant design flow rate is 10 liters per second per treatment train for a maximum treatment capacity of 20 liters per second.

Raw water is pumped from Wolf Creek into the treatment plant which is designed to operate at a constant flow, which is controlled by a modulating butterfly valve upstream of the treatment trains. There are two water treatment trains consisting of a flocculation tanks, DAF tanks, clarification unit with tube settlers and a mixed media filter of anthracite/sand/gravels.

A float piloted diaphragm valve controls the flow out of the filter to maintain a constant head over the media. The treated water from each train is combined prior to flowing through a single Ultraviolet (UV) disinfection unit. Following UV disinfection, the water flows into the clear well where 12% sodium hypochlorite is added. The sodium hypochlorite is injected and monitored in the clear well; control is provided by a chlorine residual analyzer. Finally, the treated water is fed into the Reservoir (capacity of 1.3 million liters) to allow contact time for disinfection (chlorination) and ensure an adequate supply during peak demand times such as cannery operations and fire fighting.

Figure 2: Alwyn Lake Dam and reservoir

4. SYSTEM CLASSIFICATION

The District of Port Edward Water Treatment Facility is registered with the Environmental Operators Certification Program (EOCP) as a Level 3 plant with Registration No. 177.

5. OPERATOR CERTIFICATION

The District of Port Edward currently has one certified operator with Level III Water Treatment Certification and Level I Water Distribution and one operator with a Small Water Systems designation. The District is looking to hire a second Utility Operator with a minimum of Level II Certification.

Succession planning, staff mentorship and training is very important now and over the next several years. Currently two staff are accumulating hours to prepare for their Level 1 Water Treatment Certification.

6. WATER QUALITY RESULTS

The quality of drinking water is a function of the water source, water treatment, and changes made to the water quality after treatment. Monitoring consists of three main components: raw water monitoring, treated water monitoring and distribution system treated water monitoring.

Our water permit is with the Northern Health Authority and requires the following:

- A certified operator at Level III;
- 2 bacteriological samples per month;
- An up to date Emergency Response Plan (last updated 2011 and under update for 2020);
- Minimum chloring residual of .2ppp and daily monitoring, and
- Turbidity of maximum 1 NTU in accordance with Canadian Drinking Water Guidelines.

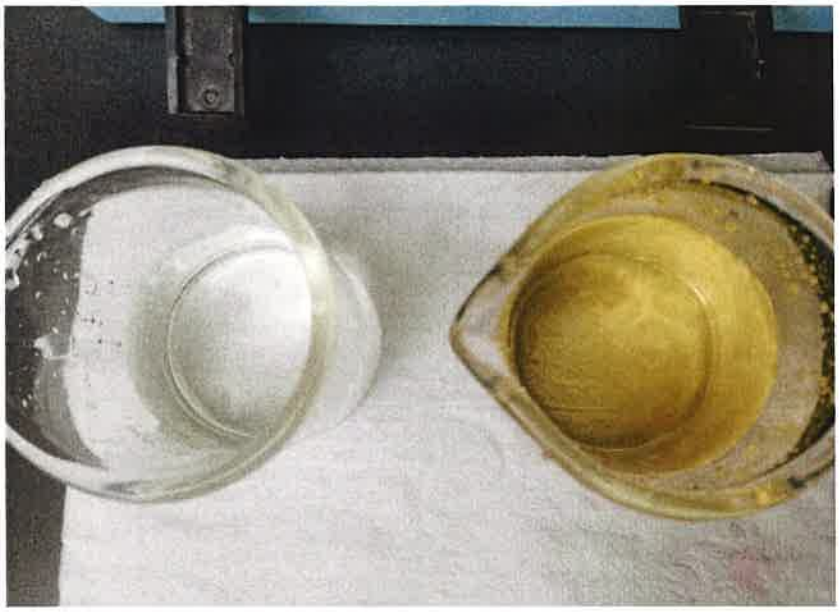

Figure 3: Port Edward treated water on left and raw water from Wolf Creek on right.

Water samples are collected and submitted every second week for bacteriological analysis. This is our main method of determining water quality. Sample results are available online using the Public Health Protection database from Northern Health. (www.healthspace.ca/nha)

Over the course of 2019, the water system operators also collected samples every week from representative locations with the community water system. Between January 1, 2019 and December 31, 2019, a total of 90 samples were collected and submitted to Northern health for analysis of Total Coliforms (TC) and E.Coli. No samples during that period contained TC or E.Coli.

As well as bacteriological testing, full chemistry analysis is done bi-annually and was last done in July, 2020. This is a full metals test for the Water Treatment Plant and the raw water coming into the Water Treatment Plant. (Appendix A).

Figure 4: One of the two water trains and our Utility Operator

7. TREATED WATER CONSUMPTION

The District of Port Edward provides treated water to the townsite and raw water to Ridley Island for industrial use. The chart below outlines the amount of treated water provided to the community.

Water Flows 2019

	Flow in Cubic Meters	Average	Minimum	Maximum
January	7,995	258	223	326
February	10,370	370	253	476
March	9,222	297	260	344
April	8,986	300	235	411
May	13,290	429	368	517
June	12,268	438	391	496
July	12,693	423	287	539
August	11,170	360	268	430
September	11,181	386	332	441
October	12,483	416	339	658
November	9,748	336	279	430
December	10,730	346	255	541
Yearly Total	**130,136**			

8. WATER PLANT UPGRADES

In 2020, a major plant upgrade was completed of the Programmable Logic Controller (PLC), which automates many functions of the plant operations. This was a $140,000 project that modernized our technology to ensure efficient plant operations well into the future.

APPENDIX A: Core Chem Analysis

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ANALYTICAL REPORT

District of Port Edward
770 Pacific Avenue
Port Edward, BC V0V 1G0
sduffus@portedward.ca

Project: Drinking Water
Project Number: -
Project Manager: Scott Duffus

Work Order: N906208

RECEIVED: 25-Jun-2019

REPORTED: 31-Jul-2019

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Northern Laboratories (2010) Ltd.

Jesse Newton
Laboratory Manager

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Northern Laboratories (2010) Ltd.

ANALYTICAL REPORT

District of Port Edward - Drinking Water **Work Order:** N906208

LAB #				**N906208-01**	**N906208-02**
SAMPLED DATE				**25-Jun-19**	**25-Jun-19**
SAMPLED TIME				**11:25**	**11:10**
SAMPLE ID				**WTP - Raw**	**Port Edward Public Works Sink (Treated)**
	MRL	***Units***	***CDWG***		
General Parameters (Water)					
pH	*1.0*	*pH units*	*7.0-10.5*	**4.5**	**6.9**
Alkalinity (total, as CaCO3)	*1*	*mg/L*	-	<5	**19**
Conductivity	*1.0*	*uS/cm*	-	**647**	**109**
Colour	*1*	*PtCo units*	*AO <= 15*	**33**	**1**
Turbidity	*0.05*	*NTU*	*MAC = 1*	**2.61**	**0.30**
Solids, Total Dissolved / TDS	*1.0*	*mg/L*	*AO <= 500*	**490**	**78**
Carbon, Total Organic	*0.50*	*mg/L*	-	**3.84**	**2.00**
Ammonia (total as N)	*0.03*	*mg/L*	-	**0.03**	<0.03
Nitrogen, Total Kjeldahl	*0.050*	*mg/L*	-	**0.220**	**0.191**
Calculated Parameters (Water)					
Total Trihalomethanes	*0.00400*	*mg/L*	*MAC = 0.1*	<0.00400	**0.0850**
Nitrate (as N)	*0.50*	*mg/L*	*MAC = 10*	<0.50	
Nitrate (as N)	*0.10*	*mg/L*	*MAC = 10*		<0.10
Nitrogen, organic	*0.0500*	*mg/L*	-	**0.220**	**0.191**
Hardness, Total (as CaCO3)	*0.500*	*mg/L*	-	**12.6**	**12.8**
Anions (Water)					
Chloride	*1.0*	*mg/L*	*AO <= 250*	**198**	**21.3**
Fluoride	*0.05*	*mg/L*	*MAC = 1.5*	<0.10	<0.10
Nitrite (as N)	*0.01*	*mg/L*	*MAC = 1*	<0.01	<0.01
Nitrate + Nitrite (as N)	*0.10*	*mg/L*	*MAC = 10*	<0.50	<0.10
Sulfate	*1.0*	*mg/L*	*AO <= 500*	**3.0**	**1.1**
Total Metals (Water)					
Aluminum, total	*0.0050*	*mg/L*	*OG < 0.1*	**73.5**	**0.393**
Antimony, total	*0.00020*	*mg/L*	*MAC = 0.006*	<0.00020	<0.00020
Arsenic, total	*0.00050*	*mg/L*	*MAC = 0.01*	<0.00050	<0.00050
Barium, total	*0.0050*	*mg/L*	*MAC = 1*	**0.0281**	**0.0147**
Beryllium, total	*0.00010*	*mg/L*	-	<0.00010	<0.00010
Bismuth, total	*0.00010*	*mg/L*	-	<0.00010	<0.00010
Boron, total	*0.0050*	*mg/L*	*MAC = 5*	**0.0058**	<0.0050
Cadmium, total	*0.000010*	*mg/L*	*MAC = 0.005*	**0.000015**	<0.000010
Calcium, total	*0.20*	*mg/L*	-	**4.36**	**4.54**
Chromium, total	*0.00050*	*mg/L*	*MAC = 0.05*	**0.00088**	**0.00088**

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SAMPLED TIME				11:25	11:10
SAMPLE ID				WTP - Raw	Port Edward Public Works Sink (Treated)
	MRL	*Units*	*CDWG*		
Total Metals (continued)					
Cobalt, total	*0.00010*	*mg/L*	-	**0.00010**	<0.00010
Copper, total	*0.00040*	*mg/L*	*AO <= 1*	**0.00388**	**0.0148**
Iron, total	*0.010*	*mg/L*	*AO <= 0.3*	**0.155**	**0.024**
Lead, total	*0.00020*	*mg/L*	*MAC = 0.005*	**0.00098**	**0.00070**
Lithium, total	*0.00010*	*mg/L*	-	**0.00071**	**0.00023**
Magnesium, total	*0.010*	*mg/L*	-	**0.412**	**0.346**
Manganese, total	*0.00020*	*mg/L*	*AO = 0.02, MAC = 0.12*	**0.0117**	**0.00573**
Mercury, total	*0.000010*	*mg/L*	*MAC = 0.001*	<0.000010	<0.000010
Molybdenum, total	*0.00010*	*mg/L*	-	<0.00010	<0.00010
Nickel, total	*0.00040*	*mg/L*	-	**0.00133**	<0.00040
Phosphorus, total	*0.050*	*mg/L*	-	<0.050	<0.050
Potassium, total	*0.10*	*mg/L*	-	**0.24**	**0.29**
Selenium, total	*0.00050*	*mg/L*	*MAC = 0.05*	<0.00050	<0.00050
Silicon, total	*1.0*	*mg/L*	-	**1.4**	**1.1**
Silver, total	*0.000050*	*mg/L*	-	<0.000050	<0.000050
Sodium, total	*0.10*	*mg/L*	*AO <= 200*	**14.5**	**16.6**
Strontium, total	*0.0010*	*mg/L*	-	**0.0102**	**0.0094**
Sulfur, total	*3.0*	*mg/L*	-	<3.0	<3.0
Tellurium, total	*0.00050*	*mg/L*	-	<0.00050	<0.00050
Thallium, total	*0.000020*	*mg/L*	-	<0.000020	<0.000020
Thorium, total	*0.00010*	*mg/L*	-	<0.00010	<0.00010
Tin, total	*0.00020*	*mg/L*	-	**0.00022**	<0.00020
Titanium, total	*0.0050*	*mg/L*	-	<0.0050	<0.0050
Tungsten, total	*0.0010*	*mg/L*	-	<0.0010	<0.0010
Uranium, total	*0.000020*	*mg/L*	*MAC = 0.02*	**0.000033**	<0.000020
Vanadium, total	*0.0010*	*mg/L*	-	**0.0014**	<0.0010
Zinc, total	*0.0040*	*mg/L*	*AO <= 5*	**0.0149**	**0.0043**
Zirconium, total	*0.00010*	*mg/L*	-	**0.00030**	<0.00010
Haloacetic Acids (Water)					
Monochloroacetic Acid	*0.0020*	*mg/L*	-	<0.0020	<0.0020
Monobromoacetic Acid	*0.0020*	*mg/L*	-	<0.0020	<0.0020
Dichloroacetic Acid	*0.0020*	*mg/L*	-	<0.0020	<0.0020
Trichloroacetic Acid	*0.0020*	*mg/L*	-	<0.0020	**0.0233**
Dibromoacetic Acid	*0.0020*	*mg/L*	-	<0.0020	<0.0020

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LAB #					
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SAMPLED TIME				11:25	11:10
SAMPLE ID				WTP - Raw	Port Edward Public Works Sink (Treated)
	MRL	*Units*	*CDWG*		
Haloacetic Acids (continued)					
Total Haloacetic Acids (HAA5)	*0.00200*	*mg/L*	*MAC = 0.08*	<0.00200	**0.0233**
2-Bromopropionic Acid	*70-130*	*[surr]*	-	*108%*	*107%*
Volatile Organic Compounds (VOC) (Water)					
Bromodichloromethane	*0.0010*	*mg/L*	-	<0.0010	**0.0028**
Bromoform	*0.0010*	*mg/L*	-	<0.0010	<0.0010
Chloroform	*0.0010*	*mg/L*	-	<0.0010	**0.0822**
Dibromochloromethane	*0.0010*	*mg/L*	-	<0.0010	<0.0010
Toluene-d8	*70-130*	*[surr]*	-	*113%*	*101%*
4-Bromofluorobenzene	*70-130*	*[surr]*	-	*115%*	*109%*

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
mg/L	Milligrams per Litre
NTU	Nephelometric Turbidity Units
pH units	pH units
PtCo units	Platinum Colbalt colour units
uS/cm	Micro Siemens per centimeter
MAC	Maximum Acceptable Concentration. Values above MAC are formatted with **red** text and solid outline.
AO	Aesthetic Objective (not health related). Values above AO are formatted with a dashed outline.
OG	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2014) http://www.hc-sc.gc.ca/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf

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ANALYTICAL REPORT

District of Port Edward
770 Pacific Avenue
Port Edward, BC V0V 1G0
sduffus@portedward.ca

Project: Drinking Water
Project Number: -
Project Manager: Scott Duffus

Work Order: N912135

RECEIVED: 19-Dec-2019

REPORTED: 19-Jan-2020

All analyses were performed in accordance with standard procedures published by BC MoE, Health Canada, Environment Canada, the American Public Health Association, or the US EPA.

Northern Laboratories (2010) Ltd.

Jesse Newton
Laboratory Manager

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ANALYTICAL REPORT

District of Port Edward - Drinking Water **Work Order:** N912135

LAB #				**N912135-01**	**N912135-02**
SAMPLED DATE				**19-Dec-19**	**19-Dec-19**
SAMPLED TIME				**11:00**	**11:20**
SAMPLE ID				**WTP - Raw**	**Port Edward Public Works Sink (Treated)**
	MRL	***Units***	***CDWG***		
General Parameters (Water)					
pH	*1.0*	*pH units*	*7.0-10.5*	**6.7**	**7.2**
Alkalinity (total, as CaCO3)	*1*	*mg/L*	-	**7**	**23**
Conductivity	*1.0*	*uS/cm*	-	**21.9**	**118**
Colour	*1*	*PtCo units*	*AO <= 15*	**83**	<1
Turbidity	*0.05*	*NTU*	*MAC = 1*	**1.38**	**0.22**
Solids, Total Dissolved / TDS	*1.0*	*mg/L*	*AO <= 500*	**27**	**66**
Carbon, Total Organic	*0.50*	*mg/L*	-	**7.29**	**1.16**
Ammonia (total as N)	*0.03*	*mg/L*	-	<0.03	<0.03
Nitrogen, Total Kjeldahl	*0.050*	*mg/L*	-	**0.250**	**0.094**
Calculated Parameters (Water)					
Total Trihalomethanes	*0.00400*	*mg/L*	*MAC = 0.1*	<0.00400	**0.0307**
Nitrate (as N)	*0.10*	*mg/L*	*MAC = 10*	<0.10	<0.10
Nitrogen, organic	*0.0500*	*mg/L*	-	**0.250**	**0.0940**
Hardness, Total (as CaCO3)	*0.500*	*mg/L*	-	**9.15**	**14.2**
Anions (Water)					
Chloride	*1.0*	*mg/L*	*AO <= 250*	**2.4**	**22.7**
Fluoride	*0.05*	*mg/L*	*MAC = 1.5*	<0.10	<0.10
Nitrite (as N)	*0.01*	*mg/L*	*MAC = 1*	<0.01	<0.01
Nitrate + Nitrite (as N)	*0.10*	*mg/L*	*MAC = 10*	<0.10	<0.10
Sulfate	*1.0*	*mg/L*	*AO <= 500*	**1.5**	**1.6**
Total Metals (Water)					
Aluminum, total	*0.0050*	*mg/L*	*OG < 0.1*	**0.204**	**0.135**
Antimony, total	*0.00020*	*mg/L*	*MAC = 0.006*	<0.00020	<0.00020
Arsenic, total	*0.00050*	*mg/L*	*MAC = 0.01*	<0.00050	<0.00050
Barium, total	*0.0050*	*mg/L*	*MAC = 1*	**0.0138**	**0.0113**
Beryllium, total	*0.00010*	*mg/L*	-	<0.00010	<0.00010
Bismuth, total	*0.00010*	*mg/L*	-	<0.00010	<0.00010
Boron, total	*0.0050*	*mg/L*	*MAC = 5*	<0.0050	**0.0539**
Cadmium, total	*0.000010*	*mg/L*	*MAC = 0.005*	**0.000016**	<0.000010
Calcium, total	*0.20*	*mg/L*	-	**3.16**	**5.13**
Chromium, total	*0.00050*	*mg/L*	*MAC = 0.05*	**0.00095**	**0.00058**

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ANALYTICAL REPORT

District of Port Edward - Drinking Water **Work Order:** N912135

LAB #				**N912135-01**	**N912135-02**
SAMPLED DATE				**19-Dec-19**	**19-Dec-19**
SAMPLED TIME				**11:00**	**11:20**
SAMPLE ID				**WTP - Raw**	**Port Edward Public Works Sink (Treated)**
	MRL	***Units***	***CDWG***		
Total Metals (continued)					
Cobalt, total	*0.00010*	*mg/L*	-	**0.00013**	<0.00010
Copper, total	*0.00040*	*mg/L*	*AO = 1* *MAC = 2*	**0.00084**	**0.00304**
Iron, total	*0.010*	*mg/L*	*AO <= 0.3*	**0.394**	**0.053**
Lead, total	*0.00020*	*mg/L*	*MAC = 0.005*	<0.00020	**0.00040**
Lithium, total	*0.00010*	*mg/L*	-	**0.00013**	**0.00021**
Magnesium, total	*0.010*	*mg/L*	-	**0.306**	**0.334**
Manganese, total	*0.00020*	*mg/L*	*AO <= 0.02* *MAC = 0.12*	**0.0116**	**0.00398**
Mercury, total	*0.000010*	*mg/L*	*MAC = 0.001*	<0.000010	<0.000010
Molybdenum, total	*0.00010*	*mg/L*	-	<0.00010	**0.00012**
Nickel, total	*0.00040*	*mg/L*	-	**0.00091**	<0.00040
Phosphorus, total	*0.050*	*mg/L*	-	<0.050	<0.050
Potassium, total	*0.10*	*mg/L*	-	**0.33**	**0.34**
Selenium, total	*0.00050*	*mg/L*	*MAC = 0.05*	<0.00050	<0.00050
Silicon, total	*1.0*	*mg/L*	-	**1.2**	**1.1**
Silver, total	*0.000050*	*mg/L*	-	<0.000050	<0.000050
Sodium, total	*0.10*	*mg/L*	*AO <= 200*	**1.19**	**20.1**
Strontium, total	*0.0010*	*mg/L*	*MAC = 7*	**0.0073**	**0.0087**
Sulfur, total	*3.0*	*mg/L*	-	<3.0	<3.0
Tellurium, total	*0.00050*	*mg/L*	-	<0.00050	<0.00050
Thallium, total	*0.000020*	*mg/L*	-	<0.000020	<0.000020
Thorium, total	*0.00010*	*mg/L*	-	<0.00010	<0.00010
Tin, total	*0.00020*	*mg/L*	-	<0.00020	<0.00020
Titanium, total	*0.0050*	*mg/L*	-	<0.0050	<0.0050
Tungsten, total	*0.0010*	*mg/L*	-	<0.0010	<0.0010
Uranium, total	*0.000020*	*mg/L*	*MAC = 0.02*	<0.000020	<0.000020
Vanadium, total	*0.0010*	*mg/L*	-	<0.0010	<0.0010
Zinc, total	*0.0040*	*mg/L*	*AO <= 5*	<0.0040	<0.0040
Zirconium, total	*0.00010*	*mg/L*	-	<0.00010	<0.00010
Haloacetic Acids (Water)					
Monochloroacetic Acid	*0.0020*	*mg/L*	-	<0.0020	<0.0020
Monobromoacetic Acid	*0.0020*	*mg/L*	-	<0.0020	<0.0020
Dichloroacetic Acid	*0.0020*	*mg/L*	-	<0.0020	**0.0110**

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ANALYTICAL REPORT

District of Port Edward - Drinking Water **Work Order:** N912135

LAB #				**N912135-01**	**N912135-02**
SAMPLED DATE				**19-Dec-19**	**19-Dec-19**
SAMPLED TIME				**11:00**	**11:20**
SAMPLE ID				**WTP - Raw**	**Port Edward Public Works Sink (Treated)**
	MRL	***Units***	***CDWG***		
Haloacetic Acids (continued)					
Trichloroacetic Acid	*0.0020*	*mg/L*	-	<0.0020	**0.0149**
Dibromoacetic Acid	*0.0020*	*mg/L*	-	<0.0020	<0.0020
Total Haloacetic Acids (HAA5)	*0.00200*	*mg/L*	*MAC = 0.08*	<0.00200	**0.0259**
2-Bromopropionic Acid	*70-130*	*[surr]*	-	*105%*	*107%*
Volatile Organic Compounds (VOC) (Water)					
Bromodichloromethane	*0.0010*	*mg/L*	-	<0.0010	**0.0021**
Bromoform	*0.0010*	*mg/L*	-	<0.0010	<0.0010
Chloroform	*0.0010*	*mg/L*	-	<0.0010	**0.0286**
Dibromochloromethane	*0.0010*	*mg/L*	-	<0.0010	<0.0010
Toluene-d8	*70-130*	*[surr]*	-	*85%*	*85%*
4-Bromofluorobenzene	*70-130*	*[surr]*	-	*154% [1]*	*150% [1]*

Special Notes

1 = Surrogate recovery outside of control limits. Data accepted based on acceptable recovery of other surrogates.

Glossary of Terms

MRL	Method Reporting Limit
<	Less than the reported detection limit (RDL)
mg/L	Milligrams per Litre
NTU	Nephelometric Turbidity Units
pH units	pH units
PtCo units	Platinum Colbalt colour units
uS/cm	Micro Siemens per centimeter
MAC	Maximum Acceptable Concentration. Values above MAC are formatted with **red** text and solid outline.
AO	Aesthetic Objective (not health related). Values above AO are formatted with a dashed outline.
OG	Operational guideline (for treated water)

Standards / Guidelines Referenced

CDWG	Canadian Drinking Water Quality Guidelines (2019) https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/pdf/pubs/water-eau/sum_guide-res_recom/sum_guide-res_recom-eng.pdf